

WHAT IS CLAIMED IS:

1. A folding machine provided downstream of a printing unit of a rotary printing machine, comprising:

a cut-off unit comprising

5 a cut-off mechanism for cutting off a sheet at a predetermined cut-off length position from a web fed from said printing unit, and

a first belt conveyor comprising a pair of conveyor belts for nipping and conveying said sheet 10 cut off by said cut-off mechanism;

a processor, provided downstream of said cut-off unit, for processing said sheet cut off by said cut-off unit; and

15 a second belt conveyor provided between said cut-off unit and said processor and comprising at least one pair of conveyor belts for receiving said sheet conveyed by said first belt conveyor and conveying said sheet to said processor;

20 wherein said second belt conveyor varies a sheet conveying speed during the conveyance of said sheet so that in receiving said sheet from said first belt conveyor, said sheet conveying speed becomes approximately equal to a first speed at which said sheet is conveyed in said first belt conveyor, and in conveying said sheet to said 25 processor, said sheet conveying speed becomes approximately equal to a second speed at which said sheet is conveyed in said processor.

2. The folding machine as set forth in claim  
1, wherein

5 said cut-off unit is constructed such that it  
can vary and cut a cut-off length of the web fed from said  
printing unit;

a speed at which said web is conveyed is set  
according to a cut-off length of said sheet that is cut  
off by said cut-off unit; and

10 said first speed at which said sheet is conveyed  
in said first belt conveyor is set so that it becomes equal  
to the web conveying speed.

3. The folding machine as set forth in claim  
1 or 2, wherein said cut-off unit comprises

15 a first cut-off mechanism for partially cutting  
said web; and

a second cut-off mechanism, provided downstream  
of said first cut-off mechanism, for cutting off said sheet  
from said web by cutting uncut portions of said web that  
is not cut by said first cut-off mechanism.

20 4. The folding machine as set forth in claim  
3, wherein said first belt conveyor nips said web that  
is cut by said second cut-off mechanism, and which further  
comprises a fourth belt conveyor comprising a pair of  
conveyor belts for nipping and conveying said web to said  
25 first cut-off mechanism.

5. The folding machine as set forth in claim  
3 or 4, further comprising a first relative-phase changer,

interposed between said first cut-off mechanism and said second cut-off mechanism, for changing relative phases of rotation of said first cut-off mechanism and said second cut-off mechanism when varying a cut-off length of said 5 web fed from said printing unit.

6. The folding machine as set forth in any one of claims 3 to 5, further comprising:

a scored-line forming mechanism, provided upstream of said first and second cut-off mechanisms, for 10 forming a horizontally scored line in said web at a predetermined position; and

a second relative-phase changer, interposed between said scored-line forming mechanism and said first cut-off mechanism, for changing relative phases of 15 rotation of said scored-line forming mechanism and said first cut-off mechanism when varying a cut-off length of said web fed from said printing unit.

7. The folding machine as set forth in any one of claims 1 to 6, wherein said sheet conveying speed of 20 said processor is faster than that of said first belt conveyor.

8. The folding machine as set forth in claim 7, wherein said second belt conveyor receives said sheet at a speed approximately equal to the sheet conveying speed 25 of said first belt conveyor, then accelerates the sheet conveying speed to a speed approximately equal to the sheet conveying speed of said processor, then delivers said sheet

to said processor at a speed approximately equal to the sheet conveying speed of said processor, and decelerates the sheet conveying speed to the sheet conveying speed of said first belt conveyor and receives a sheet next cut 5 off from said web.

9. The folding machine as set forth in any one of claims 1 to 8, wherein said processor comprises a discharger for discharging a sheet cut off by said cut-off unit or a folder for folding a sheet cut off by said cut-off 10 unit along a crease perpendicular to a sheet conveying direction.

10. The folding machine as set forth in any one of claims 1 to 9, wherein

15 said folder comprises a catching cylinder equipped with a catcher, and a folding cylinder equipped with a gripper for holding said sheet and a folding blade for causing said catcher to catch said sheet; and

20 said folding cylinder is equipped with a first frame that supports said gripper and rotates on an axis of said folding cylinder, a second frame that supports said folding blade and rotates on said axis of said folding cylinder, and a third relative-phase changer for changing relative phases of rotation of said first and second frames.

25 11. The folding machine as set forth in any one of claims 1 to 10, wherein said first belt conveyor, said second belt conveyor, said cut-off unit, and said processor are respectively driven by different motors, and a phase

of each of said motors can be relatively varied.

12. The folding machine as set forth in any one of claims 1 to 11, further comprising an abutting portion, provided between said second belt conveyor and said 5 processor, which a front end of said sheet abuts and by which a conveying phase of said sheet in said folder can be adjusted.

13. The folding machine as set forth in any one of claims 1 to 12, further comprising a third belt conveyor, 10 provided downstream of said second belt conveyor and at an entrance portion to said processor, which comprises a pair of conveyor belts for receiving said sheet from said second belt conveyor and conveying said sheet to said processor at the sheet conveying speed of said processor.

15 14. The folding machine as set forth in any one of claims 1 to 13, further comprising

a non-circular roller, provided at a position where said sheet is delivered from one of said two belt conveyors adjacent to each other to the other of said two 20 belt conveyors, which guides one of a pair of conveyor belts and has a plurality of surface portions in which distances from a center of rotation to the surface portions are different.

15. The folding machine as set forth in any one 25 of claims 1 to 14, wherein the conveyor belts of said second belt conveyor are driven by non-circular rollers having a plurality of surface portions in which distances from

a center of rotation to the surface portions are different.

16. A folding machine provided downstream of a printing unit of a rotary printing machine, comprising:

5 a cut-off unit capable of varying a cut-off length of a web fed from said printing unit and cutting off a sheet from said web; and

10 a folder, provided downstream of said cut-off unit, for folding said sheet cut off from said web by said cut-off unit along a crease perpendicular to a sheet conveying direction;

15 wherein said cut-off unit has a first cut-off mechanism for partially cutting said web at a predetermined cut-off length position, a belt conveyor for nipping and conveying said web partially cut by said first cut-off mechanism, and a second cut-off mechanism for cutting off a sheet with a predetermined cut-off length by cutting uncut portions of said web conveyed by said belt conveyor;

20 and wherein said folder is provided downstream of said belt conveyor and comprises a pair of folding rollers and a chopper folder for chopper-folding said sheet in cooperation with said folding rollers by moving into a space between said folding rollers.

25 17. A variable cut-off length type rotary printing machine comprising the folding machine as set forth in any one of claims 1 to 16 and constructed such that it can vary and cut a cut-off length of a printed web.